Waste is always a major concern when designing an energy producing system. When working with an internal combustion engine, only so much can be done to reduce the amount of waste being generated. To help improve on its efficiency, wasted energy can be brought back into the system to be reused as additional work. Introducing a mechanism in the exhaust pipe of an automobile can provide an innovative method in utilizing the otherwise wasted exhaust energy. Through this approach, the kinetic velocity of the exhaust gas can be used to drive a turbine, which can generate power and be stored for future use.

The purpose of this project is to develop an optimal turbine design that can capture the exhaust energy from a car motor, similar to the method used by a turbocharger, but instead, to use the recovered energy to charge a battery. By providing an increase of efficiency, this design can help reduce auto emissions by allowing car manufacturers to create smaller and more efficient hybrid systems while providing an alternate innovation in recharging the batteries. The reduction of the CO2 emissions will also be an important part of our consideration to help preserve the planet.

For this project, our team will be designing different types of turbine blades that can be adapted to an automobile exhaust pipe to utilize the high speed of exhaust gas. The kinetic energy will be converted to electrical energy while maintaining the engine’s efficiency. The major challenge of our design will be to develop an optimal turbine blade that will introduce a negligible amount of back pressure in the exhaust pipe. This will allow the turbine to capture as much energy as possible without affecting the performance of the engine.